Feb. 28. Nordmannia cordifolia.
Mar. 1. Hyoscyamus Scopolia.
1. Primula nivalis.
2. Doronicum caucasicum.
2. Tussilago nivea.
4. Narcissus pumila.
5. Anemone Pulsatilla.
7. Asarum Europæum.
8. Omphalodes verna.
9. Iberis sempervirens.
11. Cardamine hirsuta.
11. Erythronium Dens-Canis.
11. Scilla bifolia, alba.
Mar. 11. Scilla bifolia, cærulea (13th of March).
11. Pulmonaria mollis.
11. Vinca major.
12. Tussilago alba.
12. Sisyrinchium grandiflorum.
13. Hyoscyamus Physaloides.
13. Cheiranthus Cheiri.
14. Draba aizoides.
14. Aponogeton distachyon (in open-air pond).
14. Symphytum caucasicum.
14. Ribes sanguineum.

Mr. Evans stated that he had made similar observations on the flowering of plants in the Experimental Garden. In a warm situation *Sisyrinchium grandiflorum* and *Primula denticulata* were in flower on the 19th of February. *Bellis perennis* flowered on the 25th of February, and the Apricot on the 1st of March.

Specimens of dye-woods were sent for exhibition by Michael Connal, Esq.

Mr. Stark exhibited specimens of *Leptothrix tinctoria* and *Chylocladia reflexa* from Mr. Ralfs; also of *Sphacelaria plumosa* in fructification, *S. scoparia* from Arran, and *S. filicina* from the county of Down, Ireland.

MISCELLANEOUS.

On the Pathology of the Silk-Worm (Bombyx Mori, *L.*). *Examination of the Blood.* By F. E. Guérin-Meneville.

The author has directed his attention to that most terrible malady which attacks the silk-worm, and is known in the nurseries by the name of *Muscardine*. It depends upon a microscopic plant belonging to the group *Botrytis*, which developes itself in the worm whilst living, and destroys it at the very period at which it spins the precious cocoons which ought to repay all the care and expense bestowed upon the animal.

The blood of a healthy silk-worm examined as it leaves the body, exhibits under the microscope, globules analogous to those of the human blood; but these globules are developed and reproduced from each other during the entire course of the life of the animal, and pass through the following phases, which may be observed in the same drop of blood. At first there are minute globules exhibiting in their centre simply a single opake point; the globule when grown larger presents a *nucleus* composed of several granules of equal size. At a third period, these granules become disaggregated and tend towards the circumference of the globule; finally, they push outwards the various points of its external envelope upon which they press; hence the circumference of the globule presents projections resembling buds which soon open and give passage to the granules which have produced them; these when once set free in the serum become surrounded by a transparent membrane, and form new globules in the first stage of development. These curious facts, which the author only admits

after numerous observations, and having verified them in several other species of insects, are still less astonishing than those which characterize the pathological state of the same blood.

The blood of the worms when affected with other maladies than muscardine, contains fewer globules in proportion to the proximity of the death of the animal. But the appearance of the blood explains the disappearance of the globules. At first, those found in it in small numbers are all mature, or have even already discharged their granules externally; whilst globules in progress of development are entirely absent, but in their place are observed corpuscles in every respect resembling the granules of the nucleus of the mature globules. These corpuscles, which are all alike, move with rapidity, although there appears to be no cause for their motion, which moreover presents all the characters of voluntary motion.

M. Guérin, by numerous observations which have been verified by other persons, has acquired the conviction that these corpuscles are the granules which have escaped from the nucleus of the globules existing in the blood. These granules under the influence of the morbid state have not been able to form new globules, and then enter upon a kind of independent vitality which begins the disorganization of the diseased individual by that of its nutritive fluid. We can now understand the absence of the globules in the earliest periods of their development, and the constantly greater diminution of the globules in proportion as the animal approaches its end; it is a source which flows off without renovation. M. Guérin-Meneville gives the name of *Hæmatozoides* to the animals thus developed in the diseased blood. He has also met with them in other insects; and what is still more curious, is that he has succeeded in producing them at pleasure in healthy insects, by causing them to endure hunger for some days; so that, at least in insects, depauperization of the blood from the action of debilitating causes of any kind is caused by the inaptitude of the existing nucleolar granules to form new ones. This result undoubtedly deserves great attention.

But muscardine has presented to M. Guérin some facts of a still more remarkable character. In it, whether the worm has acquired the disease naturally, or some sporules of *Botrytis bossiana* which produces muscardine have been placed upon its body with the point of a needle, even before the morbid condition is announced by any external signs, the blood begins to exhibit the hæmatozoids; they increase every hour, and intermixed with them very short navicular bodies are soon seen, but which speedily become developed, even under the mere influence of moisture into the thallus or root of the muscardic *Botrytis*. At this period of the disease, M. Guérin has seen one of the most curious phænomena in organic nature, and one which bears upon several long-debated questions; he has seen the *Hæmatozoides*, those animated corpuscles which originated from the nucleolar granules, gradually become transformed into the thallus of the *Botrytis*. They acquire a more elongated form, the motion still existing; then when they have acquired a further state of elongation, the motion ceases, and the animate matter is metamorphosed into vegetable matter, which however continues to grow more and more.

So that after the death of the muscardic worm, the blood is filled with the thallus in every stage of development. In the latter case, crystals of a perfectly definite form are mixed with the thallus; these are products of some chemical reaction, and are undoubtedly the cause of the rigidity of the dead body of the muscardic worm.

By means of abstractions of the circulating fluid, which are very easily effected, M. Guérin is able to satisfy himself of the state of health of silk-worms, or to predict to the silk-worm cultivator the invasion of such and such diseases; and this is useful, especially in muscardine; for by ceasing to feed those worms which are doomed to an inevitable death, an enormous quantity of mulberry-leaves are œconomized, and the pecuniary loss entailed by such accident is considerably diminished.

The reproduction of the globules of the blood appears to be quite new and of extreme importance in a physiological point of view. It explains very simply the unequal diameters of the globules of the blood of the Invertebrata, and directs us to researches in other species of this extensive group with a view of ascertaining the same facts, and to the Vertebrata themselves to find its analogies. In the latter, the perfect uniformity in the globules of the blood might *à priori* indicate a want of analogy; but, if real, we must first accurately determine it; if it be only apparent, we must discover the truth which is still unknown.

On the other hand, we must bear in mind, that in the Vertebrata, the nutritive fluid is met with in different states; the chyle, lymph, and blood. The blood is its ultimate expression, the terminal or perfect state; it is probably not in it therefore that we must seek for these phænomena of degeneration of the globules. Those of the lymph, which are colourless and smaller, have long been regarded as an earlier stage of them. By a coincidence which is at least remarkable in the frog, the triton, and the tortoise, where it has been possible to make observations upon the lymph, the size of the lymphatic globules pointed out by authors is exactly that of the nuclei of the globules of the blood in the same animal; the shape, certainly, differs, but the relation of size is constant. Lastly, there is a curious fact connected with this question: Schultz, who has observed the formation of the *area vasculosa* in the embryo of birds, states that the nucleus is the first part which appears; the vesicle being ultimately formed around it.—*Gazette des Hôpitaux*, Feb. 2, 1850.

BRITISH MUSEUM.

To the Editor of the Annals of Natural History.

Sir,—Having been in the habit of continually using the Natural History collection in the British Museum, never finding any difficulty, and knowing by experience that it is the most completely arranged, and far more easy of access than any other collection in the country, or on the continent, I was surprised to read in the Report of the British Museum Commissioners, the following words as the bases of all their observations on the Department:—

"Being aware from the Memorial presented to the First Lord of the Treasury on the 10th of March 1847, by a very numerous body of